

What is claimed is:

1. A gas sensor comprising a sensor element having a gas-introducing hole close to an end of said sensor element;

5                   said sensor element including a first space for  
introducing a measurement gas thereinto from said gas-  
introducing hole via a first diffusion rate-determining  
section, a main pumping means for controlling a partial  
pressure of oxygen contained in said measurement gas  
introduced into said first space to be substantially  
constant, a second space for introducing said measurement  
gas thereinto from said first space via a second diffusion  
rate-determining section, and an electric signal-generating  
converting means for reducing or decomposing a NO<sub>x</sub> component  
10                  contained in said measurement gas introduced from said  
second space via a third diffusion rate-determining section  
to generate an electric signal corresponding to an amount of  
oxygen produced thereby so that a concentration of NO<sub>x</sub>  
15                  existing in said measurement gas is determined from said  
electric signal, wherein

$$30\% \leq (W_c/W_e) < 70\%$$

wherein  $W_e$  represents a lateral width of said end of said sensor element, and  $W_c$  represents a lateral width of said gas-introducing hole.

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2. The gas sensor according to claim 1, wherein said electric signal-generating converting means is a measuring

5 pumping means which reduces or decomposes said NO<sub>x</sub> component contained in said measurement gas introduced from said second space via said third diffusion rate-determining section, which pumps out oxygen produced thereby, and which detects a current generated by pumping out the oxygen.

10 3. The gas sensor according to claim 1, wherein said electric signal-generating converting means is a detecting means which reduces or decomposes said NO<sub>x</sub> component contained in said measurement gas introduced from said second space via said third diffusion rate-determining section and which detects an electromotive force corresponding to a difference between an amount of oxygen produced by said reduction or decomposition and an amount of 15 oxygen contained in a reference gas.

20 4. The gas sensor according to claim 1, wherein said sensor element further includes a heater for maintaining at least said first space and said second space at a predetermined temperature, and

$$20\% < (La/We) < 50\%$$

wherein La represents a distance from a projected position of an end of said heater on an upper surface of said sensor element to said end of said sensor element.

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5. The gas sensor according to claim 4, wherein said projected position of said end of said heater on said upper

surface of said sensor element is approximately coincident with a projected position of a starting end of said first space on said upper surface of said sensor element.

5       6. The gas sensor according to claim 1, wherein each of said first diffusion rate-determining section and said second diffusion rate-determining section is defined by a slit provided in said sensor element.

10       7. The gas sensor according to claim 1, wherein said sensor element further includes a fourth diffusion rate-determining section between said gas-introducing hole and said first diffusion rate-determining section;

15       a space between said gas-introducing hole and said fourth diffusion rate-determining section functions as a clogging-preventive space; and

another space between said fourth diffusion rate-determining section and said first diffusion rate-determining section functions as a buffering space.

20       8. The gas sensor according to claim 7, wherein said fourth diffusion rate-determining section is defined by a slit provided in said sensor element.

25       9. The gas sensor according to claim 8, wherein a lateral width of said clogging-preventive space, a lateral width of said buffering space, a lateral width of said slit

of said first diffusion rate-determining section, and a lateral width of said slit of said fourth diffusion rate-determining section are substantially identical with each other.

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10. The gas sensor according to claim 9, wherein said lateral width of said gas-introducing hole is substantially identical with said lateral width of said clogging-preventive space.

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11. The gas sensor according to claim 1, further comprising an auxiliary pumping means for controlling a partial pressure of oxygen contained in said measurement gas introduced into said second space.

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